Dam Safety: Trees and Brush

The establishment and control of proper vegetation is an important part of dam maintenance. Properly maintained vegetation can help prevent erosion of embankment and earth channel surfaces, and aid in the control of groundhogs and muskrats. The uncontrolled growth of vegetation can damage embankments and concrete structures and make close inspection difficult. Thick brush and weed growth can obscure seepage problems which can get progressively worse if left un-noticed.

Trees and Brush

Trees and brush should not be permitted on embankment surfaces or in vegetated earth spillways. Extensive root systems can provide seepage paths for water. Trees that blow down or fall over can leave large holes in the embankment surface that will weaken the embankment and can lead to increased erosion. Brush obscures the surface limiting visual inspection, provides a haven for burrowing animals, and retards growth of grass vegetation. Tree and brush growth adjacent to concrete walls and structures may

Figure 1 – Trees and brush on dam embankment

eventually cause damage to the concrete and should be removed.

Stump Removal & Sprout Prevention

Stumps of cut trees should be removed so vegetation can be established and the surface mowed. Stumps can be removed either by pulling or with machines that grind them down. All woody material should be removed to about 6 inches below the ground surface. The cavity should be filled with well-compacted soil and grass vegetation established.

Stumps of trees in riprap cannot usually be pulled or ground down, but can be chemically treated so they will not continually form new sprouts. Certain herbicides are effective for this purpose and can even be used at water supply reservoirs if applied by licensed personnel. For product information and information on how to obtain a license, contact the Indiana Department of Agriculture at the following address:

Indiana Department of Agriculture
1931 Liberty Drive
Bloomington, IN 47403
(812) 334-4323

These products should be painted, not sprayed, on the stumps. Other instructions found on the label should be strictly followed when handling and applying these materials. Only a few commercially available chemicals can be used along shorelines or near water.

Tree Removal

The following guidelines are recommended when removing trees from dams:

Small trees (less than 6 to 12 inches)

- cut flush, remove all trunk and branches from site
- treat stump if possible to prevent regrowth

Large trees (greater than 6 to 12 inches)

- lower water level in reservoir to safe level
- remove tree, stump, rootball, and perennial roots (depending on location, as defined below)

1) **upstream slopes**
- remove rootball
- excavate a bench where rootball was extracted
- backfill bench with compacted, cohesive soil
- install wave erosion protection

2) **crest**
- remove rootball and major roots
- clean rootball cavity
- backfill rootball cavity with compacted, cohesive soil
- plant grass

3) **steep downstream slopes** (> 2.5H:1V)
- cut trees with 2 to 3-ft stumps
- extract stumps with rootball
- remove roots during benching
- flatten slopes with compacted, cohesive soil
- install embankment toe drain system

4) **moderate to flat downstream slopes** (< 2.5H:1V)
- upper 1/3 of slope height
- use same procedure as crest of dam
- middle 1/3 of slope height
- remove rootball and major roots
- clean rootball cavity
- backfill rootball cavity with compacted, cohesive soil, or install a filtered drain system
- plant grass where necessary
- lower 1/3 of slope height
- use same procedure as steep downstream slopes

5) **beyond toe of downstream slopes**
- remove rootball and major roots
- clean rootball cavity
- install a filtered drain system or weighted filter system
- plant grass where necessary

Embankment Maintenance

Embankments, groins, areas adjacent to spillway structures, vegetated channels, and other areas associated with a dam require continual maintenance of the vegetal cover. Grass mowing, brush cutting, and removal of woody vegetation (including trees) are necessary for the proper maintenance of a dam, dike, or levee. All embankment slopes and vegetated earth spillways should be mowed at least twice per year. Trees and brush should be removed in all areas within 25 feet of the embankment. Aesthetics, unobstructed viewing during inspections, maintenance of a non-erodible surface, and discouragement of groundhog habitation are reasons for proper maintenance of the vegetal cover.

Methods used in the past for control of vegetation, but are now considered unacceptable, include chemical spraying, and burning. More acceptable methods include the use of weed whips or power brush-cutters and mowers. Chemical spraying to first kill small trees and brush is acceptable if precautions are taken to protect the local environment.

It is important to remember not to mow when the

Figure 2 – Well-maintained embankment

embankment is wet. It is also important to use proper equipment for the slope and type of vegetation to be cut. Also, always follow the manufacturer's recommended safe operation procedures.

Any questions, comments, concerns, or fact sheet requests should be directed to the Division of Water at the following address:

Indiana Department of Natural Resources
Division of Water
402 West Washington Street
Indianapolis, Indiana 46204
(317) 232-4160 (Voice) (317) 233-4576 (Fax)
http://www.in.gov/dnr/water